U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

TRANSMITTAL

NV O 440.1

3-26-96

Subject: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES

FILING INSTRUCTIONS. Please file the attached immediately following DOE O 440.1 in your DOE and NV Directives Manual.

U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

ORDER

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Subject: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES

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1. OBJECTIVE. This Order supplements Attachment 2, paragraph 18, OCCUPATIONAL MEDICAL, and is to be used in conjunction with DOE O 440.1, WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES, of 9-30-95, and Change 1, of 10-26-95. It provides additional DOE Nevada Operations Office (DOE/NV) policies and procedures for the implementation of departmental directives. This supplemental directive does not change any requirements of the DOE Order but contains additional administrative or contractual guidance for DOE/NV.

2. CANCELLATION. NONE.

3. APPLICABILITY. The provisions of this Order apply to the Medical Contractor performing work for DOE/NV and all contractor organizational elements of DOE/NV at the Nevada Test Site (NTS) and other sites under DOE/NV jurisdiction. The Medical Contractor shall develop equivalent programs at other sites as provided by law and/or contract and as implemented by the Contracting Officer.

5. RESPONSIBILITIES AND AUTHORITIES.

   g. Assistant Manager for Technical Services. Responsible for management and administration of the contractor Occupational Medical Program.

   h. Director, Safety and Health Division (SHD). Responsible for program direction, compliance oversight, appraisals, and inspections.

   i. Site Occupational Medical Director. Responsible for direction and day-to-day operations of the DOE/NV Occupational Medical Program. Afforded direct access to DOE/NV Principal Staff and contractor management for consultation and discussions of the site-wide Occupational Medical Program, in general, to facilitate communication of vital information to ensure the safety and health of contractor employees.

INITIATED BY:
Safety and Health Division

7. REFERENCES.

   a. DOE Order 1324.5B, RECORDS MANAGEMENT PROGRAM, of 1-12-95.

   b. DOE Order 5530.2, NUCLEAR EMERGENCY TEAM, of 9-20-91.

   c. Title 29 Code of Federal Regulations (C.F.R.), part 1904, Recording and Reporting Occupational Injuries and Illnesses.

   d. Title 10 C.F.R., part 1046, Physical Protection of Security Interests.

   e. Title 10 C.F.R., part 745, Protection of Human Subjects.

   f. American National Standards Institute (ANSI) Z136.1-1993, American National Standard for Safe Use of Lasers.

   g. ANSI Z88.2-1992, American National Standard for Respiratory Protection.

   h. Nevada Revised Statutes (NRS) 450.B, Emergency Medical Services.

8. DEFINITIONS.

   a. Site Occupational Medical Director. Contractor Physician designated by the DOE/NV Manager responsible for the day-to-day operations of the DOE/NV Occupational Medical Program. Serves as the Occupational Medical Advisor to all contractor managers and has complete access to the DOE/NV Manager and senior staff for consultation and advice on all occupational medicine issues.

      The Site Occupational Medical Director will have a Queens Level Security Clearance or its equivalent, and will be the sole contact for all management requests for information unless otherwise delegated by him.

   b. Nevada Test Site. A 1,350 square mile area of land located 65 miles northwest of Las Vegas and those areas in proximity to the NTS, that the DOE/NV provides logistic support or management for the conduct of operations.

   c. DOE/NV Principal Staff. Includes the DOE/NV Manager, Deputy Manager, assistant managers, Aviation Operations Manager, Chief Counsel, Chief Financial Officer, and heads of all offices and divisions.

9. POLICY. Occupational medicine policy and procedures that have an impact outside of the parent company, may be established by the contracted occupational medical department management, subject to approval by the

Assistant Manager for Technical Services (AMTS). AMTS may seek outside assistance in reviewing and approving the policy and procedures.

10. EMERGENCY MEDICAL SERVICES. Emergency medical services will be provided and maintained for all employees and visitors at the NTS and at other locations as provided by law and/or contract as requested and implemented by the DOE/NV Contracting Officer.

    a. Emergency medical services will conform to the requirements of NRS 450.B for a permitted industrial paramedic ambulance service. All applicable provisions of NRS 450.B will be adhered to as delineated by the Official Permit issued by the State of Nevada.

    b. Training of all paramedics will conform to requirements of NRS 450.B to ensure that all paramedics meet the minimum requirements to maintain State of Nevada certification.

    c. A paramedic "RIDE ALONG" program will be established to allow all paramedics to maintain proficiency in administering emergency medical services. This program will be established with a community paramedic ambulance service or designated hospital trauma center. All paramedics will rotate through this "Ride Along" refresher training program on yearly basis.

11. AIR EVACUATION.

    a. Requests for utilization of emergency medical evacuation by aircraft will be coordinated with the Site Occupational Medical Director or their designated on call physician and the DOE/NV Duty Officer. The DOE/NV Duty Officer will make appropriate security arrangements for the utilization of this aeromedical emergency medical evacuation.

    b. Only air ambulance licensed and certified by the State of Nevada or the Federal Government or appropriately equipped U.S. Military aircraft may be used to transport critically ill or injured employees who require rapid evacuation to a designated trauma center.

12. AMBULANCE UTILIZATION ON AND OFF THE NTS AND DOE/NV MANAGED OR CONTROLLED AREAS. NTS Occupational Medicine Department Emergency Medical Services personnel and equipment may render emergency medical services off the NTS upon receiving official requests from appropriate civilian authorities. All requests for NTS Emergency Medical Services either on or off the NTS or DOE/NV managed or controlled areas will be coordinated with the Site Occupational Medical Director or his designee and the DOE/NV Duty Officer. Emergency medical service assets will be dispatched on availability as determined by the Occupational Medicine Department and the DOE/NV Duty Officer.

13. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS. The Occupational Medical Program will include regulations that have been included or adopted by DOE and will consider for inclusion in its occupational medical plan, all medical and other requirements found in the Federal Regulations listed under the REFERENCES section of this Order.

14. HAZARD COMMUNICATIONS BETWEEN CONTRACTORS AND THE OCCUPATIONAL MEDICINE DEPARTMENT.

    a. It is essential for the safety and health of contractor employees that hazardous work environments, processes, and programs be adequately reviewed by the Site Occupational Medical Director prior to the beginning of operations. It is important that contractor management communicate to the Site Occupational Medical Director the resumption of activities that have been closed or dormant for long periods of time. This will require written communication giving notification of new or newly reopened operations anywhere on the NTS or in areas managed or controlled by DOE/NV. This will be accomplished at a minimum of 30 days prior to the beginning of operations to allow adequate time to schedule appropriate occupational medical coverage.

    b. The use of any chemicals or new processes to be utilized in these operations will be communicated to the Site Occupational Medical Director by a health and safety plan that includes material safety data sheet information 30 days prior to the commencement of operations. This is to allow time for preplanning activities and arrangement of the appropriate medical support.

    c. Industrial hygiene identified individual personnel exposure data which exceeds OSHA standards or, in the professional judgment of the Industrial Hygienist is hazardous to the health of contractor employees, will be forwarded to the Site Occupational Medical Director.

15. DETERMINATION OF EMERGENCY MEDICAL SUPPORT STAFFING AND POSITION AT THE NTS AND OTHER AREAS MANAGED AND CONTROLLED BY DOE/NV.

    a. The allocation of emergency medical support utilized for operations at the NTS or other areas managed and controlled by DOE/NV, shall be determined by DOE/NV and contractor management upon advice and recommendations from the Site Occupational Medical Director.

    b. Contractors initiating new operations or resuming old operations that have be inactive for 3 or more months, will provide the required information to the Site Occupational Medical Director 30 days in advance of commencement of operations. The Site Occupational Medical

Director or his staff will perform a thorough review and site visit in applying the risk matrix as outlined in the Quality Working Group Report to determine criteria for emergency medical support staffing and positioning at the NTS. (See Attachment 1.)

16. DOE/NV CONTRACTOR FLIGHT PERSONNEL.

    a. The designated DOE/NV Site Occupational Medical Director has the responsibility to ensure that personnel on flight duty are able to complete their assigned duties in a manner that will not endanger themselves, other employees, or the public.

    b. Contractor flight duty personnel may be removed from flying status by any of the Occupational Medicine Department physicians when they deem it unsafe for that person to perform flying duties because of medical conditions, potential medication effects from prescribed or over-the-counter drugs, or for any other mental or emotional condition that could impair judgment. The Site Occupational Medical Director will notify contractor management and supervisors immediately of the removal from flight status by telephone. The Site Occupational Medical Director will send a formal written letter notifying contractor management of the flying duty within 3 days.

    c. Contractor flight duty personnel can only be returned to flying status after being certified fit for duty by both the Federal Aviation Administration Certified Aeromedical Examiner and the Site Occupational Medical Director, at no cost to the employee.

    d. The Site Occupational Medical Director will notify contractor management and supervisors immediately of the return to flight status by telephone and will give a written document certifying return to full flight status for the employee to hand carry to his contractor management and supervisor. The Site Occupational Medical Director will send a formal written letter notifying contractor management of the return to full flying duty within 3 days.

17. SUPPORT OF NEVADA EMERGENCY MANAGEMENT AND NUCLEAR EMERGENCY SEARCH TEAM (NEST) OPERATIONS. The DOE/NV Site Occupational Medical Director will also have the responsibility as the NEST Occupational Medical Director.

    a. The DOE/NV Site Occupational Medical Director, in consultation with NEST managers, will develop world-wide medical deployment standards for DOE/NV and DOE/NV contractor personnel involved in NEST deployments and exercises.

    b. The DOE/NV Site Occupational Medical Director will be responsible for certifying that DOE/NV and contractor personnel are physically capable of performing assigned tasks during NEST deployments and they

do not pose a health or safety threat to themselves, other personnel, or to the public at large.

c. The DOE/NV Site Occupational Medical Director will ensure that those DOE/NV and contractor personnel designated for deployment as NEST team members have their international immunizations kept current, and that proper certification is kept by the DOE/NV Occupational Medicine Department and NEST personnel.

d. The DOE/NV Site Occupational Medical Director will assign personnel to render medical support for DOE/NV NEST activities as requested by DOE/NV management. The exact number and mix of specialized medical personnel assigned to the NEST activity will be determined by the Site Occupational Medical Director in consultation with DOE/NV and NEST management.

18. NONOCCUPATIONAL MEDICAL CARE. Treatment for nonoccupational injuries and illness of employees will be provided on a limited basis in accordance with the following guidance:

a. In emergency situations, the employee will be provided with appropriate medical treatment until placed under the care of their personal physician.

b. For minor disorders, first-aid, or palliative conditions, treatment may be given if the condition is one for which the employee would not be reasonably expected to seek the attention of a personal physician, or to enable the employee to complete their current work shift before consulting their physician. Requests for repetitive treatment of nonoccupational disorders shall be discouraged, and individuals requesting such should be referred to their personal physicians.

c. When an employee is seen for any reason, the attending physician or other health care provider will be aware of any specific work hazards necessitating certain health or physical requirements and will advise the individual and parent organization when a potential impairment could present a hazard to the employee or co-workers or the public at large.

d. Services to nonemployees on and off the NTS may be provided at the request of public officials or other responsible individuals under emergency circumstances. Specifically, emergency cases from surrounding communities or other State or Federal establishments and highway accident victims may be treated on a mercy mission basis as required in the best judgment of the attending medical personnel. Ambulance response and evacuation to Las Vegas, Nevada, medical facilities will be provided as required. Evacuation to the NTS

medical facility may be performed only in extreme circumstances and when authorized by a physician.

e. Whenever an ambulance and or a physician leaves the NTS in support of an emergency, the Operations Coordination Center (OCC) at (702) 295-7893 and the operations contractor Duty Officer at (702) 295-6929 will be immediately notified. Such notification will describe the circumstances as then known. Following determination of the nature of the situation, the OCC will be provided with sufficient additional information to provide information to other DOE/NV and contractor cognizant officials as appropriate.

f. NTS organizations shall advise the Occupational Medicine Department of any special medical problems of their employees who are assigned to the NTS, as well as any special emergency medications or potential treatments required for such individuals.

19. QUALITY ASSURANCE REVIEW.

a. The DOE/NV Site Occupational Medicine Director will establish quality peer reviews of a representative sampling of occupational medical treatments rendered by the occupational medicine physicians, nurses and paramedics. These quality assurance peer reviews may be accomplished by establishment of internal peer review organizations, or contracting outside peer review organizations.

b. To improve the delivery of occupational medicine at DOE/NV, minutes and records of these peer reviews will be maintained and recommendations from the peer reviews committee/group meetings will be forwarded to the Site Occupational Medical Director for appropriate action.

20. DESIGNATIONS. The Site Occupational Medical Director is nominated by the contractor responsible for the Site Occupational Medical Program, and will receive approval of official designation of duty and delegation of authority from the DOE/NV Manager.

21. DETERMINATIONS. Questions should be referred to the DOE/NV SHD at (702) 295-0904; or write to the U.S. Department of Energy, Nevada Operations Office, Safety and Health Division, P.O. Box 98518, Las Vegas, Nevada 89193-8518.

22. REQUEST FOR COPIES OF DIRECTIVES. Requests for copies of this directive should be directed to the U.S. Department of Energy, Nevada Operations Office, Safety and Health Division, P.O. Box 98518, Las Vegas, Nevada 89193-8518; or telephone the DOE/NV SHD at (702) 295-0904.

23. RECORDS RETENTION. All contractor employee occupational medicine records shall be maintained by the Site Occupational Medical Director. These files will be maintained and protected in accordance with DOE Order 1324.5B and other records retention directives issued by DOE.

Terry A. Vaeth
Acting Manager

Report of the Quality Working Group (QWG) to Determine Criteria for Emergency Medical Support Staffing and Positioning at the Nevada Test Site

Ronald E. Costin, M.D., M.P.H.
Chairman

February 18, 1994

EXECUTIVE SUMMARY

Recognizing that there are no definitive criteria for determining the need for, or placement of, emergency medical support services for Nevada Test Site (NTS) work activities, the REECo Executive Office directed the formation of a Quality Working Group to develop such criteria for management approval.

Under chairmanship of the Site Occupational Medicine Director, representatives from safety and operational departments were appointed by their respective Division Managers. The group evaluated available data which might bear on the question, from the private community as well as the Nevada Test Site Operations (NTSO) community, and determined to assign relative "weight" to various key factors which should be on the criteria.

A major factor analyzed and discussed was the medical response time. Other factors considered included:

1. The availability of ancillary emergency medical care such as employees trained in first aid and cardiopulmonary resuscitation (CPR) and fire protection personnel with Emergency Medical Technician (EMT) training.

2. NTS ambulance response trends by number, type, and area.

3. The relative risk of NTS activities, and

4. Transit personnel (auto & bus).

The QWG did <u>not</u> address the issue of transport times from the NTS to definitive treatment centers in Las Vegas, since that subject is under study by a DOE Quality Improvement Team.

The factors to be considered in developing the criteria were narrowed to three:

1. Relative risk of the work activity.

2. Size of the employee population at the worksite.

3. Response time from the Mercury Medical Facility to the worksite.

It was further decided to develop relative weighting criteria for each factor consonant with the Risk Assessment Code (RAC) scale as established in DOE Order 5481.1B and implemented in REECo Safety Procedure A-17, as follows:

RISK CODE	5	4	3	2	1

JOB RISK (RAC)	LOW	LOW	MOD	HIGH	HIGH
AMBULANCE RESPONSE TIME (MINUTES)	<10	10-16	17-23	24-30	31 OR >
POPULATION	<10	10-20	21-30	31-40	41 OR >

A new Medical risk code (MRC) is proposed, which is a simple summation of the three risk codes assigned from the above table.

A Medical Risk code (MRC) of ten or greater is deemed to be an acceptable risk. A MRC smaller than ten will generally require repositioning of medical support, since this is usually the most controllable factor. An exception is that any operation with an Ambulance Response Time Risk Code of 5 is acceptable, and determination of a Medical Risk code (MRC) is not necessary.

Recommendations are presented to effect a DOE/NV directive to assure supply of necessary data by agencies operating at the NTS to the Occupational Medicine Department (OMD) of REECo, for the development of OMD implementing procedures, and for immediate implementation in REECo through a Company procedure.

REPORT OF THE QUALITY WORKING GROUP (QWG) TO DETERMINE CRITERIA FOR EMERGENCY MEDICAL SUPPORT STAFFING AND POSITIONING AT THE NEVADA TEST SITE (NTS).

I. STATEMENT OF THE PROBLEM:

Currently, there are no definitive procedures or parameters for determining the need for, appropriateness of, or level and proximity required for provision of medically staffed aid facilities for various types of industrial activity at the Nevada Test Site (NTS). The need for the development of such criteria is made more acute by:

A. A decrease in the level of activity at the NTS, resulting in smaller, but still widely dispersed work teams.

B. A change in the type of industrial activity, with different attendant risks. For example, small hole drilling has largely replaced large boredrilling, and construction activity has diminished.

C. Aging of the work population leading to increased probabilities of non occupationally related medical emergencies.

D. Increasing restraints on medical support staffing and funding through budgetary reductions.

II. QUALITY WORKING GROUP FORMATION:

The Executive Office of Reynolds Electrical & Engineering Co., Inc. (REECo), supporting the premise that it is a management responsibility to take a leadership responsibility in determining the level of medical, as well as other support activities, to meet NTS needs, directed the formation of a Quality Working Group (QWG). This group with broad line, as well as medical, representation was charged to develop specific guidelines for use by management in determining when and where forward area medical emergency coverage should be provided for activities at the NTS. The Occupational Medicine Director was appointed chairman and requested representation from several line operations groups, as follows:

A. Ronald E. Costin, M.D., M.P.H., site Occupational Medicine Director and Department Manager, Occupational Medicine (OM), REECo.

B. Elbert P. Davis, Department Manager, FOD/NTS Construction, O&M Division, REECo.

C. A. Edward Baur, Occupational Safety Professional, Occupational Safety & Fire Protection Department, REECo.

D. Samuel A. Lybarger, Occupational Safety Professional, Occupational SaFety & fire Protection Department, REECo.

E. Reinhold H. Leske, Occupational Safety Professional, Yucca Mountain Project (YMP) Division, REECo.

F. G. Charles Fauergach, Emergency Medical Services (EMS) Supervisor, OMD REECo.

G. Douglas R. Rierson, EMS Trainer, OMD, REECo.

III. APPROACH:

The QWG established the following systematic approach to its deliberations:

A. Evaluation of all available data relative to community standards, DOE requirements, accident and injury experience at the NTS, relative risk of various NTS industrial activities, accident and injury statistical data for the NTS, emergency medical ambulance responses, risk analysis techniques and procedures, medical literature relating to response times and outcomes in medical (non-occupational emergencies, such as heart attacks) and traumatic emergencies (injuries), and other pertinent data.

As a basis for evaluation and deliberation, the following listed references, which are appended to this report, were reviewed:

1. Nevada State Health Division, Office of Emergency Medical Services, State Trauma Registry, Annual Trauma System Report, July 1, 1990, for calendar year 1989 (Appendix deleted).

2. Extract, DOE Order 5480.8A, "Contractor Occupational Medical Program," relative to professional staffing.

3. REECo Occupational Safety & Fire Protection Department Report of Incidents, 1993.

4. REECo Occupational Medicine Department, "Analysis of Ambulance Responses," 1988-1993 by type of emergency and by location.

5. REECo Occupational Medicine Department, report of time and distance from NTS medical facilities to numerous worksite locations at the NTS.

6. Table, "Relation of Survival Rates from Cardiac Arrest to Promptness of CPR and ACLS," Eisenberg MS, Bergner L. Hallstrom A: Cardiac resuscitation in the Community, Importance of Rapid

Provision and Implications for Planning, JAMA 1979; 241:1905-1907.

7. REECo Occupational Safety Code G-20, "First Aid, and CPR Training Requirements."

8. REECo Safety Manual, Company Safety Procedure A-17, "Safety Hazard Assessment, Risk Assessment, and Safety Analysis."

9. REECo FOD/NTS Construction Department, Drilling Section, "Hazard Analysis: Blind Shaft Drilling, Postshot Reentry Drilling, Exploratory and Well Drilling, and Surface Hole Drilling.

10. Title 29 CFR 1910.151 and 1926.50

B. Establishment of Goals: It was determined that the QWG would attempt to assign a "weight" to various key factors which should be considered in determining the requirements(s) for emergency medical service and the required proximity of that coverage. It was decided that possible factors to be considered included:

1. The number of employees at a worksite.

2. Relative risk of the work activity.

3. Relative incidence of medical (non occupational emergencies such as heart attacks) and traumatic events (injury).

4. Time and distance from the Mercury medical facility.

5. The availability of first line emergency care outside the resources of the Occupational medicine Department.

6. Number of employees in transit via automobile and bus. (The QWG discussed the question of transportation time from the site of the emergency to a definitive medical care facility such as a trauma center. However, it was recognized that a Quality Improvement Team (QIT) at DOE/NV is addressing this issue; therefore, such a study was decided to be outside the purview of this QWG.)

IV. DISCUSSION

A. Medical response time considerations: There are four factors of importance in predicting outcomes from medical and traumatic emergencies:

1. The nature of the emergency.

2. The availability of Basic Life Support (BLS) capability by persons trained in first aid and cardiopulmonary resuscitation (CPR).

3. Elapsed time from the event to initiation of Advanced Cardiac Life Support (ACLS), such as that provided by NTS paramedic personnel.

4. Transport time to a definitive medical care facility.

As indicated above, the QWG did not address factor (4). However, it is generally accepted in the medical community that outcomes are significantly improved if a patient reaches definitive medical care in a trauma center or full service medical facility within the so called "golden hour" after sustaining major trauma. Surface transportation from the NTS to Las Vegas generally exceed that time frame. The "golden hour" principle is applicable to medical emergencies such as myocardial infarction (heart attack) because of the advent of thromboembolytic (blood clot dissolution) therapy, which must be begun at least within an hour of the event, and the sooner the more effective. To have this capability at the NTS would require ambulances equipped with telemetry to a cardiac care center to allow remote medical evaluation and direction.

Equally impractical in the NTS setting is meeting the recommendation for the arrival of ACLS capability at the scene within a matter of a very few minutes in the case of cardiac arrest. As shown in Reference 6, survival rates fall precipitously if time to initiation of ACLS exceed 8 minutes and drops essentially to zero if time to initiation exceeds 16 minutes. Of course, cardiac arrest is a "worst case" scenario, and occurs with rather low frequency, even in the case of an acute myocardial event. While providing access to ACLS services within 8 minutes to all victims is an admirable goal, it is hardly realistic at the NTS because of geographical dispersion of personnel and the exorbitant costs of making such a responsiveness always available.

Relative to other rural areas in the state of Nevada, NTS emergency response capability is far superior. Most areas are dependent upon volunteer Emergency Medical Technicians (EMTs) who, for the most part, are skilled only to the intermediate cardiac life support level and must travel considerable distances to reach their patients. In addition, the "golden hour" goal for total time to definitive care is extremely difficult to meet.

B. Ancillary Emergency Care:

1. Employee First Aid & CPR Training. Survivability in either medical or traumatic emergencies is significantly enhanced by the availability onsite of CPR and first aid trained personnel at the worksite. At the NTS the number of personnel so trained far exceed the Occupational Safety & Health Administration (OSHA) guidelines (reference 10). In some organizations, such as the FOD/NTS Construction Department, essentially all employees are current in such training.

2. Fire Protection Department Support. The NTS Fire Department currently has 24 active certified Emergency Medical Technicians. In addition to providing basic life support, they can free paramedics for direct patient care by assuming ambulance driving duties and possible radio communication assistance.

C. NTS Ambulance Response Trends: A study of Reference 4 shows a rather precipitous drop in the number of emergency ambulance responses at the NTS from a total of 185 responses in 1992 to 121 in 1993. A significant portion of the decrease was due to withdrawal of personnel from Tonopah. Of further interest are the findings that:

1. Roughly 60 percent of the responses are for medical emergencies (chest pains, fainting, shortness of breath, etc.) versus about 30 percent precipitated by injury or suspected injury. The remaining 9 percent are offsite responses, primarily for injury resulting from automobile accidents on Interstate 95 outside NTS property.

2. As one would expect, the majority of responses are in Area 23 (69%): Areas 12, 6, and 25 each had roughly one ambulance response per month. In Area 20 there were no ambulance calls in 1993. There is no statistically significant variation by month.

   The low number of emergency responses, particularly for trauma, is in keeping with the statistics mentioned in Reference 1, i.e., in urban areas in the state of Nevada there are 1.03 major traumas per 1,000 population per year, and in rural areas 1.77 per 1,000.

   The preponderance of medical over traumatic emergencies at the NTS may be related, to some degree, to the average age of NTS employees, with increased likelihood for the existence of chronic diseases and their complications.

   The basic driving force for having emergency medical services available at the NTS is for management of on-the-job injuries,

but the QWG determined that emergency medical service planning must take the increased likelihood of medical type emergencies into account.

D. Relative Risk of NTS Activities: The general consensus in the QWG is that the relative level of risk of NTS industrial activity has declined in recent years, which is supported by the drop in total OSHA reportable injury rates, and lost work day case rates. Even the drop in medical emergencies may be related in part to less physical stress. Reference 9 is a general analysis of the relative risk of some current NTS activities as compared to previous ones.

The relative risk of the job activity should be a major consideration in determining parameters for emergency medical coverage. Safety analysis, risk assessment, and the assignment of Risk Assessment Codes (RAC) in accordance with the REECo Safety Manual, Company Procedure A-17. (Reference 8) should be a major part of any guideline implementation.

E. Personnel in Transit: It was determined by the QWG that any effort to staff facilities or disperse medical personnel on the basis of automobile or bus transit volume is impractical and unnecessary. Certainly, there is no civilian model for providing such coverage on the nation's interstate highways. And in the case of the NTS, aid stations manned on the basis of other guidelines should provide adequate coverage for the high volume traffic lanes on the NTS.

V. CONCLUSIONS

A. Factors to be considered in developing guidelines were narrowed by the QWG to three:

1. Relative risk of the work activity.

2. Size of the employee population at the worksite.

3. Response time from the Mercury Medical Facility to the worksite.

B. Relative Weighting of Factors: The QWG determined that for consistency, understandability, and ease of calculation each of the above factors should be weighed on the same scale as that already in place for determining and quantifying relative job risk. Under the methodology of the REECo Safety Manual, Company Safety Procedure A-17, (Reference A) Appendix 2, a Risk Assessment Code (RAC) is established for each activity or operational system. The RAC range is from 5 (low risk) to 1 (high risk). Using this model, and after considerable deliberation, the QWG established the following table of risk codes for all three factors:

RISK CODE	5	4	3	2	1
JOB RISK (RAC)	LOW	LOW	MOD	HIGH	HIGH
AMBULANCE RESPONSE TIME (MINUTES)	<10	10-16	17-23	24-30	31 OR >
POPULATION	<10	10-20	21-30	31-40	41 OR >

C. The QWG established a new Medical Risk Code (MRC) which is simply the summation of the three risk codes determined from the above table. For example, a specific job may have a RAC of 4, an ambulance response time risk code of 3, and a population risk code of 4, giving the operation a Medical Risk Code (MRC) of 11.

D. A much more difficult task, and the core of the QWG mandate, was to determine an acceptable Medical Risk Code (MRC). Admittedly, this is a somewhat arbitrary judgment, but one which takes into account not only relative risk, but cost-effectiveness, reasonableness, and accepted standards of care. On these bases it was decided that a mid-point Risk Assessment Code of 3 (moderate job risk) and a Population Risk Code of 3 (21-30 involved personnel) should reasonably precipitate action to furnish emergency medical service at the level of Risk Code 4 (10-16 minutes response time).

On that basis, an acceptable Medical Risk Code (MRC) is 10 (3 + 3 + 4). This means, simply, that for every NTS activity, management's goal should be to assure that the medical risk code is 10 or higher.

Clearly, for most operations, the most controllable factor is the positioning of emergency medical coverage to change response times, the essence of the QWG mandate. It also means that common sense would dictate that, if the ambulance response time risk code is 5 (less than 10 minutes response time) no further action is required, and calculation of a Medical Risk Code (MRC) is not required.

E. As a baseline for developing medical risk codes (MRC) for new or newly located activities:

1. Ambulance response time from the Mercury medical facility is used, with adjustments if a forward aid station is closer and is already manned for other reasons.

2. If more than one work activity is in progress in a geographic area, calculations are based on that with the highest risk (lowest RAC).

3. After emergency medical services requirements for the highest risk activity are determined, a medical risk code is developed for the totality of all activities within the area to assure that standards are met.

F. Examples of Calculation of the Medical Risk Code (MRC)

1. A small hole drilling operation is planned in Area 3, and the Department Manager determines that the Risk Assessment Code (RAC) for the activity is 3. Twelve persons are involved.

Job Risk Code	3
Population Risk Code	4
Ambulance Response Risk Code	1
Medical Risk Code (MRC)	8 (unacceptable)

Manning of the area 6 medical aid station changes the ambulance response code to 3, for a MRC of 10, an acceptable situation.

2. A team of eight people are engaged in a tower construction project on the top of Yucca Mountain, an activity assigned a Risk Assessment Code (RAC) of 1:

Job Risk Code	1
Population Risk Code	5
Ambulance Response Risk Code	1
Medical Risk Code (MRC)	7 (unacceptable)

Manning the Area 25 medical aid station changes the Ambulance Response Code to 2, for an MRC of 8, which is still unacceptable. To reach an MRC of 10 or better, the Ambulance Response Code must be 4 or higher, requiring positioning of paramedics forward of the Area 25 Aid Station, so that the ambulance response time is 16 minutes or less.

G. The REECo General Manager has the ultimate responsibility for approving medical support plans using the Medical Response Code (MRC) as a guideline.

VI. RECOMMENDED ACTIONS

A. That DOE/NV be requested to develop an order requiring that all agencies operating on the NTS notify the REECo Occupational Medicine Department (OMD) in writing of any current or planned operation outside of Mercury. This notification must include the exact location, number of personnel involved, Risk Assessment Code (RAC), and name and phone number of the responsible manager.

B. That a REECo Company procedure be developed for immediate implementation of the notification procedure as outlined above.

C. That an OMD procedure be developed for verifying receipt of the above information, for calculation of the Medical Risk Code (MRC), and for developing a recommended medical support plan for management approval, and for authenticating and memorializing management approval.

D. That the Site Occupational Medicine Director retain responsibility for determining the number of medical support personnel, the training and certification requirements, the nature and level of equipment and supplies, standard operating procedures and treatment protocols, and supervision of emergency medical personnel.